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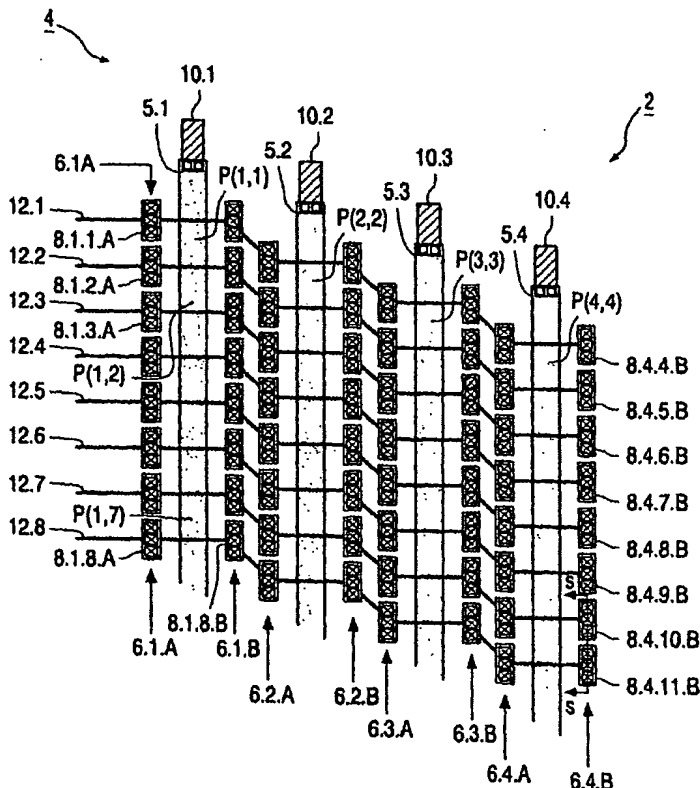
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(54) Title: **RESISTOR NETWORK SUCH AS A RESISTOR LADDER NETWORK AND A METHOD FOR MANUFACTURING SUCH A RESISTOR NETWORK**



(57) Abstract: The invention relates to a resistor network (2) such as a resistor ladder network, comprising at least a resistor body (4) which is provided with at least a column (6) of taps (8) situated between a first tap and a second tap, wherein, in use, at least two taps can be connected with respective first and second sources of reference input potentials, and wherein each tap of the at least one column of taps can be used for outputting an output potential via a contact area which is connected with the concerning tap, wherein the resistor body (4) comprises a multiple of resistor sub-bodies (5), wherein each resistor sub-body (5) is connected with a column (6) of taps (8), and wherein the only electrical connections between the resistor sub-bodies (5) are established by electrical connections via taps (8) connected with the resistor sub-bodies (5). Furthermore the invention relates to a method for manufacturing a resistor network (2) such as a resistor ladder network.

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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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EPO-Internal, WPI Data, PAJ, INSPEC, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 015, no. 284 (E-1091), 18 July 1991 (1991-07-18) -& JP 03 098317 A (NISSAN MOTOR CO LTD), 23 April 1991 (1991-04-23) abstract; figure 2	1,3,5-9
Y	---	2,4,10, 11
X	DE 197 32 842 A (ARLT STEFFEN DIPL ING ;KAMPE JUERGEN DR ING (DE)) 18 February 1999 (1999-02-18) abstract; claims; figure 4 column 2, line 32 - line 39 --- -/--	1,3,6,9

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PATENT ABSTRACTS OF JAPAN vol. 003, no. 110 (E-137), 14 September 1979 (1979-09-14) -& JP 54 087489 A (NEC CORP), 11 July 1979 (1979-07-11) abstract; figure 3 ----	2
Y	EP 0 932 256 A (SEIKO EPSON CORP) 28 July 1999 (1999-07-28) abstract; figures 1,5,8 ----	4
Y	US 4 636 831 A (OKAJIMA YOSHINORI ET AL) 13 January 1987 (1987-01-13) abstract; claims; figures 4-7 ----	10,11
A	US 4 398 207 A (HOFF JR MARCIAN E ET AL) 9 August 1983 (1983-08-09) abstract; claims; figure 4 ----	1-11
A	PATENT ABSTRACTS OF JAPAN vol. 009, no. 220 (E-341), 6 September 1985 (1985-09-06) -& JP 60 079766 A (NIPPON DENKI KK), 7 May 1985 (1985-05-07) abstract; figures 2,4,6 ----	1-11
A	US 4 181 878 A (COCCHETTI SILVANO ET AL) 1 January 1980 (1980-01-01) abstract; claims; figures -----	1,2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/JP98/02192

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 03098317	A	23-04-1991	NONE	
DE 19732842	A	18-02-1999	DE 19732842 A1	18-02-1999
JP 54087489	A	11-07-1979	NONE	
EP 0932256	A	28-07-1999	EP 0932256 A1	28-07-1999
			US 6208281 B1	27-03-2001
			WO 9901939 A1	14-01-1999
US 4636831	A	13-01-1987	JP 1592510 C	14-12-1990
			JP 2014789 B	10-04-1990
			JP 59025260 A	09-02-1984
			DE 3377315 D1	11-08-1988
			EP 0100676 A2	15-02-1984
US 4398207	A	09-08-1983	US 4146882 A	27-03-1979
			DE 2737763 A1	09-03-1978
JP 60079766	A	07-05-1985	JP 1614028 C	15-08-1991
			JP 2028269 B	22-06-1990
US 4181878	A	01-01-1980	IT 1115654 B	03-02-1986
			DE 2819149 A1	09-11-1978
			FR 2390011 A1	01-12-1978